Volunteer Lake Assessment Program Individual Lake Reports

CHALK POND, NEWBURY, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	339	**Max. Depth (m):**	3.7	**Flushing Rate (yr^{-1}):**	4.6
Surface Area (Ac.):	21	**Mean Depth (m):**	2	**P Retention Coef:**	0.56
Shore Length (m):	1,600	**Volume (m^3):**	166,500	**Elevation (ft):**	1252

TROPHIC CLASSIFICATION

Year	Trophic class
1986	OLIGOTROPHIC
2006	MESOTROPHIC

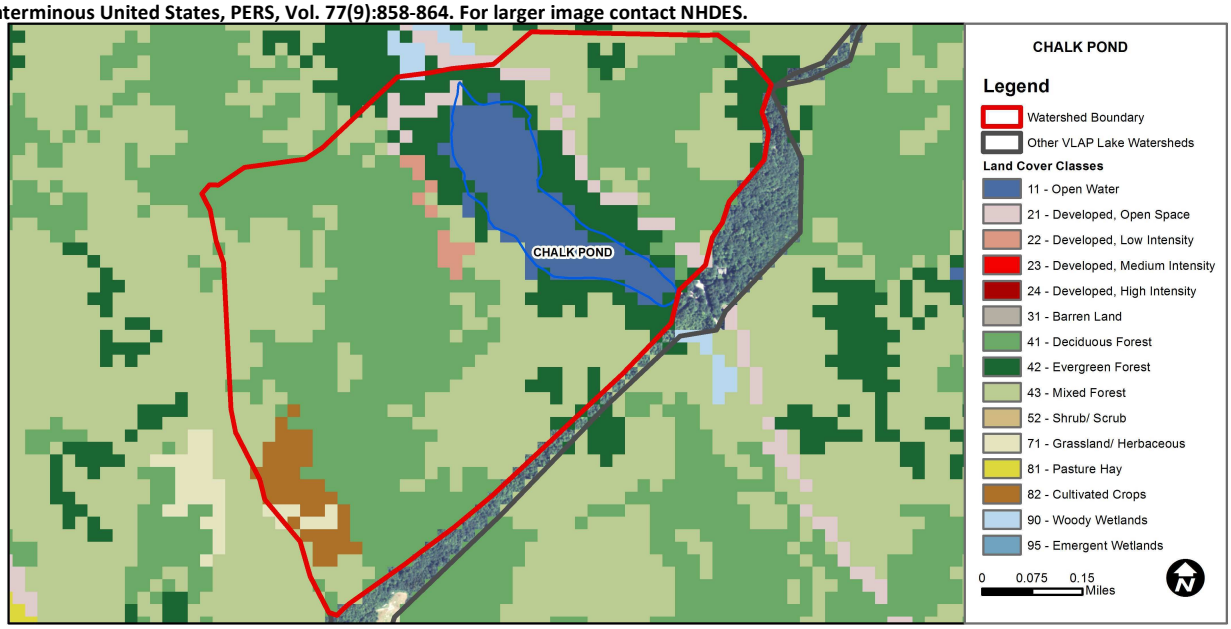
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	8.56	Barren Land	0	Grassland/Herbaceous	0.47
Developed-Open Space	2.67	Deciduous Forest	40.51	Pasture Hay	0
Developed-Low Intensity	1.02	Evergreen Forest	12.09	Cultivated Crops	3.3
Developed-Medium Intensity	0	Mixed Forest	31.79	Woody Wetlands	0
Developed-High Intensity	0	Shrub-Scrub	0	Emergent Wetlands	0

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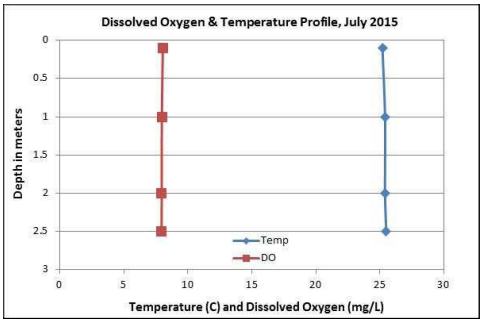
2015 Data Summary

Recommended Actions: Increase monitoring frequency to once per month during the summer to better assess seasonal variations and historical water quality trends. Water quality was good in 2015, however conductivity has increased in the pond since monitoring began. Educate homeowners on best practices for salt application on driveways, and walkways during winter months. Encourage local road agents and winter maintenance companies to obtain a NH Voluntary Salt Applicator license through the UNH Technology Transfer Center's Green SnowPro certification program. The website http://www.t2.unh.edu/road-salt-reduction has educational materials and information on salt certification classes. A variety of factors may be contributing to the worsening transparency trend. Increased stormwater runoff from high intensity storm events may transport sediments to the pond as well as flush waters rich in organic acids which add color to the water. Waters with high color content typically have decreased transparency. Water level may also play a role; if the water level is lower than normal, the corresponding transparency value may also be lower. Contact the VLAP Coordinator in the spring to schedule a biologist visit for 2016. Keep up the great work!

Observations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were average for the pond, decreased from 2014 and were less than the state median. Historical trend analysis indicates relatively stable chlorophyll since monitoring began.
- **Conductivity/Chloride:** Deep spot, Inlet and Outlet conductivity levels were approximately equal to the state median and average for most NH lakes. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity since monitoring began.
- **E. coli:** Beach E. coli levels were much less than the state standard of 88 cts/100 mL for public beaches.
- **Total Phosphorus:** Epilimnetic and Hypolimnetic (lower water layer) phosphorus levels were low and much less than the state median. Historical trend analysis indicates relatively stable epilimnetic phosphorus since monitoring began. Inlet and Outlet phosphorus levels were also low.
- **Transparency:** Transparency was very good and the Secchi disk was visible on the pond bottom. However, historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began.
- **Turbidity:** Deep spot, Inlet and Outlet turbidities were within a low to average range.
- **pH:** Hypolimnetic, Inlet and Outlet pH levels were less than the desirable range 6.5-8.0 units. Epilimnetic pH and alkalinity were not reported due to a laboratory instrument error. Historical analysis of epilimnetic pH indicates relatively stable pH with moderate variability between years.



Station Name	Table 1. 2015 Average Water Quality Data for CHALK POND								
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion		3.15	47.5		6	3.25	3.25	0.85	
Hypolimnion			47.5		7			1.25	6.00
Inlet			47.1		8			0.92	6.39
Main Beach				10					
Outlet			47.4		3			0.61	6.43

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Worsening	Data significantly increasing.	Chlorophyll-a	Stable	Trend not significant; data show low variability.
pH (epilimnion)	Stable	Trend not significantly data moderately variable.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.